

Atlantic Coast Joint Venture - Focus Area Report
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7.2.17 Virginia

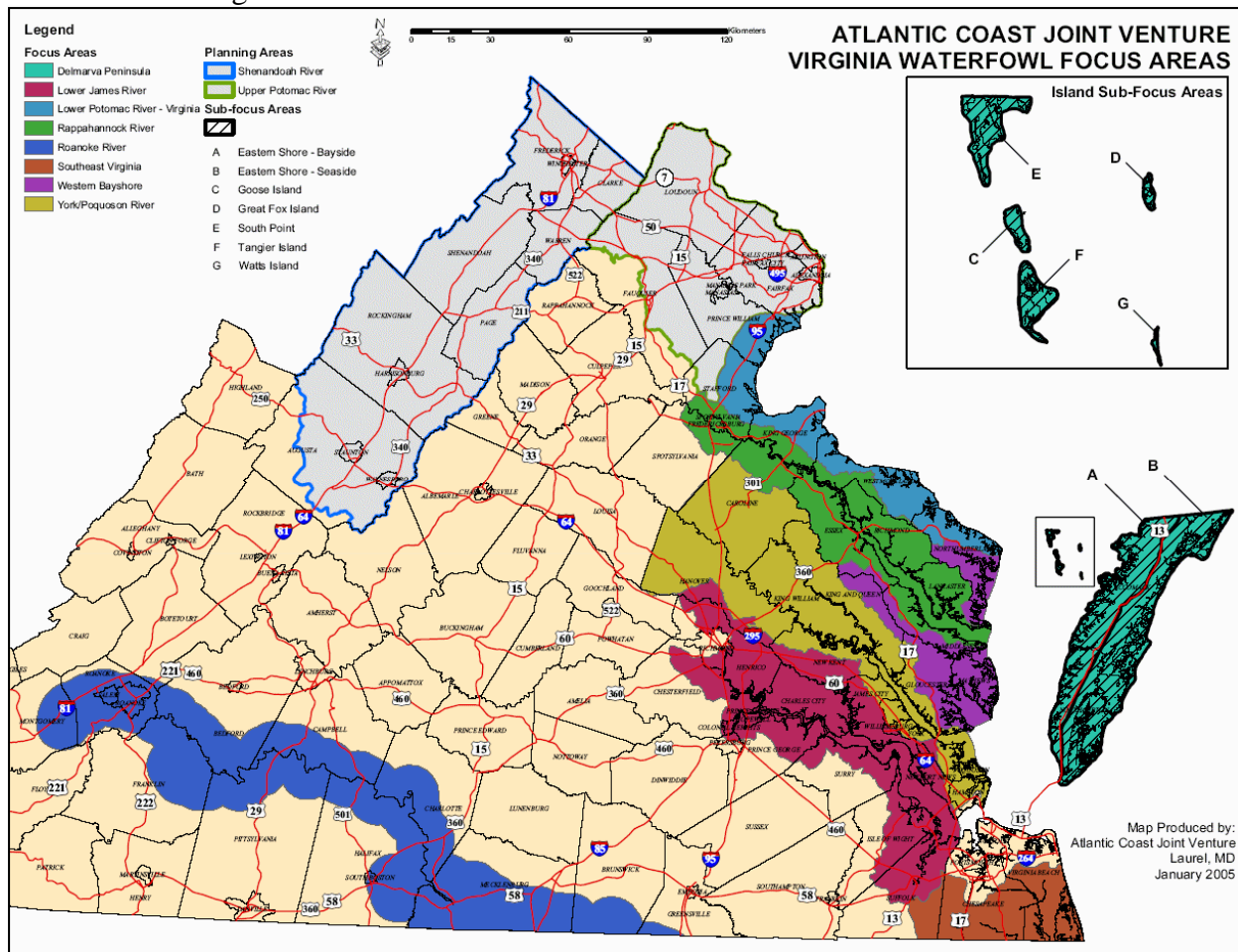


Figure 7.18. Virginia waterfowl focus areas.

Focus Area: Delmarva Peninsula, Virginia

Sub-Focus Areas: Islands, Eastern Shore-Bayside, Eastern Shore-Seaside

Area Description:

The Eastern Shore of Virginia contains a wide diversity of waterfowl habitats. An extensive set of coastal salt marshes and series of undeveloped barrier islands run the length of the Eastern Shore from Maryland to Fishermans' Island National Wildlife Refuge (NWR). On the Bayside of the Shore, brackish tidal marshes abound from Saxis Island to Hacks Neck encompass 102,225 hectare (252,601 acres). A series of islands occurs in the Chesapeake Bay along these brackish marshes. The Eastern Shore is primarily a rural agricultural, aquacultural community and includes 149,661 hectare (369,819 acres). Many individuals earn their living from the wetland community, including oystermen, crabbers, clammers, and commercial fishermen. Historically, the Eastern Shore was a hardwood-dominated mosaic of upland and wetland interspersed with freshwater, brackish, and saltwater emergent marshes. The high quality agricultural soil types resulted in the clearing and draining of much of these areas for production. In recent times, an agricultural shift has occurred from row crops to commercial vegetable production, resulting in a loss of foraging habitat for many waterfowl species. Additionally, many individuals have taken to purchasing tracts of former wetlands and restoring these sites to emergent marsh systems, resulting in the concentration of waterfowl on managed wetland habitats. The total area of this focus area is 251,886 hectares (622,420 acres).

Ownership/Protection:

Several groups are working to protect the valuable habitats on the Eastern Shore. Three National Wildlife Refuges (NWR's) are located in this focus area. Chincoteague National Wildlife Refuge NWR is located on the Maryland border, and the Eastern Shore NWR and Fishermans' Island NWR are located on the extreme southern end of the Shore. The Nature Conservancy owns several of the seaside barrier islands, and owns or holds conservation easements on a number of seaside farms. The Virginia Department of Game and Inland Fisheries owns four wildlife management areas, two on the bayside and two on the seaside (The GATR tract, Mockhorn Island Wildlife Management Area (WMA), Saxis WMA and Guard's Shore WMA) The Virginia Department of Conservation and Recreation owns one state park and two natural areas and a barrier island (Wreck Island) on the bayside of the eastern shore. Additionally, many individuals have taken to purchasing tracts of former wetlands and restoring these sites to emergent marsh systems, resulting in the concentration of waterfowl on managed wetland habitats.

Special Recognition:

In 1979, the Eastern Shore was designated as an International Biosphere Reserve by the United Nations, a site where globally important natural resources have been preserved largely intact through compatible human uses of the landscape. In 1990, the seaside barrier islands and associated beach habitat was designated as a Western Hemisphere Shorebird Network Site due to the overwhelming amount of habitat and shorebird utilization of the area.

Waterfowl:

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Five High Priority Species (Black Duck, Mallard, Pintail, Greater and Lesser Scaup) benefit from habitats located within the focus area. Managed wetland impoundments located throughout the peninsula will be heavily utilized by Black Duck, Mallard, and Northern Pintail and other dabbling ducks during the fall, winter and migration periods. The natural emergent marshes are also heavily used by Black Duck and moderately used by the other species in the same time frame. The broad shallow flats of the Bayside Islands Sub-Focus Area are heavily populated with diving ducks, including Greater and Lesser Scaup during the wintering period. Other priority species that benefit from the habitat in this focus area are Atlantic Brant, Wood Duck, Redhead, Canvasback, and American Wigeon. The seaside marshes and bays are one of the major concentration areas for Atlantic Brant along the east coast. Between 15-20,000 Atlantic Brant winter here each year, primarily on the mudflats interspersed among the seaside barrier islands. These birds feed upon the underwater grasses (sea lettuce) that abounds in these habitats. Redhead and Canvasback winter in the same areas as the Greater and Lesser Scaup, feeding upon submerged aquatic vegetation (SAV) upon the broad, shallow flats. American Wigeon utilize the managed impoundment and natural emergent marshes for wintering habitat. Wood Duck utilize the abundant freshwater marshes during migration. Other waterfowl species that stage or winter in this area include, Atlantic Population Canada Goose, Tundra Swan, Greater Snow Goose, Gadwall, resident Canada Goose, Blue-winged Teal, and Green-winged Teal.

Species that will benefit during the breeding season include the Mallard, Black Duck and Wood Duck. The coastal islands provide relatively undisturbed nesting habitat for the majority of Black Duck nesting in Virginia. Mallard are increasingly utilizing these sites as well, and also nest in more disturbed areas inland. Wood Duck nest in a variety of areas adjacent to the natural freshwater wetlands. Resident Canada Goose have dramatically increased use of the bay islands as nesting habitat. The importance of these marshes and associated open water habitat for Atlantic Brant, sea ducks, Tundra Swan, diving ducks, American Wigeon and Black Duck cannot be overstated.

Table 1. Waterfowl species using the Delmarva Peninsula Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
American Black Duck	X	X	X
Mallard	X	X	X
Northern Pintail		X	X
Greater Scaup		X	X
Lesser Scaup		X	X
American Wigeon		X	X
Canvasback		X	X
Redhead		X	X
Wood Duck	X	X	
Tundra Swan		X	X
Atlantic Brant		X	X

DRAFT

Greater Snow Goose		X	X
Blue-winged Teal		X	
Green-winged Teal		X	X
AP Canada Goose		X	X

Other Migratory Birds:

This focus area is recognized as a globally-important coastal migration corridor for passage of millions of songbirds, shorebirds, raptors, seabirds, waterfowl, and wading species. Additionally, this area supports more than 90 % of the breeding colonial waterbirds (other than Great Blue Heron) in Virginia including but not limited to; the Snowy Egret, Tricolored Heron, Little Blue Heron, and Black-crowned Night-Heron, Forester's Tern and Common Tern, and a higher percentage of the non-colonial beach nesting species within the region. High priority beach nesting species such as the Piping Plover, Wilson's Plover, and Least Tern require sandy beaches with sparse vegetation that are close in proximity to foraging areas. American Oystercatcher, Gull-billed Tern, and Black Skimmer use similar habitats but also nest on shell rakes within lagoon systems, sandy bay islands, and high berms within marshes.

Populations of Piping Plover and Wilson's Plover have remained somewhat stable around 100 pairs and 40 pairs respectively. American Oystercatcher has declined 40 % in the past twenty years. Nearly 500 breeding pairs of American Oystercatcher currently nest in this focus area and constitute over 80 % of the total breeding population in Virginia. Black Skimmer and Gull-billed Tern have declined nearly 75 % from highs in the late 1970's. Populations of these species within the focus area represent 80-85 % of all breeding individuals in Virginia.

The extensive complex of high salinity marshes supports a number of species with elevated conservation concerns. Seaside Sparrow and Clapper Rail use low and high marsh zones but reach their highest densities in lower portions of the marsh. Other species such as Black Rail, Sedge Wren, Prairie Warbler, Salt Marsh Sharp-tailed Sparrow, and Henslow's Sparrow are primarily associated with high marsh zones. The size and physiognomy of high marsh zones are important features that determine the incidence of each of these species. Sedge Wren and Salt Marsh Sharp-tailed Sparrow reach the southern limit of their breeding distribution in Accomack County, Virginia and reach only 50 % incidence in even the largest marshes. In winter, these species along with Nelson's Sharp-tailed Sparrow are more abundant and occur across a wider breadth of marsh conditions. The historical Atlantic Coast population of Henslow's Sparrow has drastically declined and is currently only known to occur at a few sites including Saxis Wildlife Management Area. Black Rail are restricted to high marsh zones composed of saltmeadow hay and at least 50 % saltgrass. The greatest amount of this type of marsh in Virginia is located within this focus area.

Small fragments of bottomland and swamp habitats are scattered across the Delmarva Peninsula. These habitats support small populations of Acadian Flycatcher, Yellow-throated Vireo, and Prothonotary Warbler. Additionally, six percent of the Virginia breeding population of Bald Eagle nest on the eastern shore.

Threats:

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Recently, properties along the waterfront on both sides of the shore have been increasingly developed. Continued conversion of agricultural and forestland to urban uses is a threat to this area. The conversion of agricultural row crops to commercial truck farming reduces foraging habitat for migratory birds. New introduction and spread of existing exotic invasives in this area continues to reduce available wildlife habitat. Declining water quality in the Chesapeake Bay and seaside marshes continue to be a threat to submerged aquatic vegetation (SAV). Increased aquaculture and the corresponding reduction in wetland habitats continue to be a threat.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Exotic invasives, such as *Phragmites* are continuing to gain a foothold in the area, and treatment of these sites needs to be continued. Future zoning of lands to reduce development will ensure the continued rural setting of this community.

Planning Area: Lower Potomac River, Virginia

Focus Areas: None

Area Description:

The Potomac River focus area is located in Northeast Virginia encompassing 168,573 hectares (416,551 acres). The area as a whole is considerably developed, as would be expected in Northern Virginia. The brackish and freshwater tidal wetlands are relatively undeveloped, and provide a wide diversity of habitat for many waterfowl species. The Potomac River proper is owned by the State of Maryland, and is not included in the focus area. The adjacent marshes are located in Virginia and are included. These marshes are composed of highly brackish *Spartina* marshes near the mouth of the Potomac to freshwater *Peltandra*, *Lotus* and wild rice marshes inland. Historically, hardwood forests dominated areas beyond the river. These forests have given way to row crop agriculture, truck farms, horse/hobby farms, loblolly pine plantations, and residential and industrial development. In recent historical times, the shallow water areas of the Potomac have a history of high-density submerged aquatic vegetation (SAV) beds (*Hydrilla*).

Ownership/Protection:

The majority of land in this focus area is in private ownership. The U.S. Fish and Wildlife Service owns Masons Neck National Wildlife Refuge (NWR) and Marumscow NWR, The Virginia Department of Conservation and Recreation owns several state parks, Mason Neck State Park, Leesylvania State Park, Caledon Natural Area, and Westmoreland State Park, as well as several small natural area preserves. Additional federal ownership in the area includes Quantico Marine Corps Base, Dahlgren Laboratory, George Washington Birthplace National Monument, and Fort Belvoir Military Reservation.

Special Recognition:

The Chesapeake Bay Estuarine Complex received Ramsar designation in 1987.

Waterfowl:

Six high priority species, (Black Duck, Mallard, Pintail, Greater and Lesser Scaup, Southern James Bay Population Canada Goose) utilize this area for wintering and migration habitat. The puddle duck species and Canada Goose utilize flooded marshes and the adjacent rivers and lakes for food in the form of invertebrates, plant material and seeds. The scaup use the adjacent open-water marshes to feed on submerged aquatic vegetation (SAV), and other invertebrates. Other priority species, including the Wood Duck, American Wigeon, Redhead, Canvasback and Ring-necked Duck heavily utilize these same areas for foraging and loafing. Wood Duck and both teal species abound in the emergent marshes for brood rearing (Wood Duck) and staging in the early fall.

Table 1. Waterfowl species using the Potomac River Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck	X	X	X

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Wood Duck	X	X	
Greater Scaup		X	X
Lesser Scaup		X	X
Redhead		X	X
Canvasback		X	X
American Wigeon		X	X
Green-winged Teal		X	X
Blue-winged Teal		X	
Ring-necked Duck		X	X
Tundra Swan		X	X
AP/SJBP Canada Goose		X	X
Gadwall		X	X
Ruddy Duck		X	X
Bufflehead		X	X
Merganser		X	X

Other Migratory Birds:

This area supports nearly 25 % of the coastal population of Bald Eagle in Virginia. Waterfront development and increased urbanization is the most important limiting factor on the distribution and future population trends of Bald Eagle and many other species in this focus area. Small, narrow fragments of bottomland and swamp forest border Potomac River tributaries but represent a relatively minor component of this area compared to other focus areas in coastal Virginia. However, these forested wetlands provide habitat for Acadian Flycatcher, Yellow-throated Vireo, Northern Parula, and Prothonotary Warbler. Small, isolated populations of Swainson's Warbler and Worm-eating Warbler may be found in forested wetlands with dense understory vegetation. Tidal marshes are irregularly distributed along the shores of the Potomac River but are extensive along some of the associated creeks and tributaries. These habitats are important for Virginia Rail, Sora, American Bittern, and Least Bittern. Marshes in the lower salinity zones and upper reaches of the Potomac River also support King Rail. Historical records indicate that the coastal plain Swamp Sparrow inhabited these areas as well. However, their complete distribution among the marshes in this focus area is unknown.

Threats:

Additional development of riparian and forested areas remains a large threat. Increasing stormwater runoff, with increased siltation and chemicals associated with urbanization degrade water quality. Increasing boat traffic, both recreational and work related, reduce refuge areas and push waterfowl to less favorable sites.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields and farmed

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wetland pasture that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Preservation of bottomland hardwood forest for nesting Wood Duck and other cavity nesting passerines needs to be addressed.

Focus Area: Lower James River, Virginia

Sub-Focus Areas: N/A

Area Description:

The Lower James River Focus Area encompasses 445,277 hectares (1,100,299 acres) and includes the James River and its tributaries from its mouth in the Chesapeake Bay to the non-tidal fall line near Richmond Virginia. It includes the Nanesmond River, the Chickahominy River, the Appomattox River and other tributaries. The area is known for its extensive brackish and freshwater tidal marshes along the expanse of the river. Extensive freshwater wetlands are found adjacent to tributary streams, and beaver ponds abound in the vicinity. Historically, hardwood forests covered the upland and interior wetland areas. This site was one of the first and most highly developed during colonial times. Currently, the area is highly developed, intermixed with low-density rural sites. Agricultural row-crops are giving way to development and planting of loblolly pine plantations.

Ownership/Protection:

The vast majority of land in this watershed is in private ownership. The U.S. Fish and Wildlife Service own the James River/Presquile National Wildlife Refuge. The federal government also owns other lands including Fort Eustis Military Reservation and Jamestown Island National Historic Site. The Virginia Department of Game and Inland Fisheries owns three sites, The Chickahominy Wildlife Management Area (WMA), Hog Island WMA, and Ragged Island WMA, each which have a large component of wetland habitat. Dutch Gap Conservation Area is owned and managed by Chesterfield County. The Virginia Department of Conservation and Recreation owns Chippokes Plantation State Park. A few large historic farms in private or corporate ownership provide the most area on private land managed for waterfowl.

Special Recognition:

The Chesapeake Bay Estuarine Complex received Ramsar designation in 1987.

Waterfowl:

Six priority waterfowl species (Black Duck, Mallard, Northern Pintail, Greater and Lesser Scaup, Southern James Bay Population Canada Goose) benefit from habitats located within the focus area. Emergent marshes along the James are heavily used by Black Duck and Mallard, and moderately used by Pintail and other dabbling ducks during the fall, winter and migration periods. Diving ducks including Greater and Lesser Scaup, Canvasback, and Ring-necked Duck use the lower James for feeding and resting during the migration and wintering period. Large numbers of Atlantic Population and Southern James Bay Population Canada Goose use the marshes and adjacent agricultural fields during the migration and wintering periods. Other priority species, which utilize this area for migration and wintering habitat, include Wood Duck, Redhead, Canvasback, Ring-necked Duck, and American Wigeon. Wood Duck and American Wigeon utilize the emergent marshes for foraging habitat, while Redhead, Canvasback, and Ring-necked Duck utilize submerged aquatic vegetation (SAV) beds for foraging. Other waterfowl species found in these habitats include Tundra Swan, Blue-winged and Green-winged Teal, Gadwall, and Merganser. Species that will benefit during the breeding season include the Mallard and Wood Duck.

Atlantic Coast Joint Venture - Focus Area Report
DRAFT

Table 1. Waterfowl species using the Lower James Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
American Black Duck		X	X
Mallard	X	X	X
Northern Pintail		X	X
Greater Scaup		X	X
Lesser Scaup		X	X
American Wigeon		X	X
Canvasback		X	X
Redhead		X	X
Ring-necked Duck		X	X
Wood Duck	X	X	
Tundra Swans		X	X
Greater Snow Goose		X	X
Blue-winged Teal		X	
Green-winged Teal		X	X
AP Canada Goose		X	X
Gadwall		X	X
Northern Shoveler		X	X
Bufflehead		X	X
Ruddy Duck		X	X

Other Migratory Birds:

This focus area is vital for recovery of the Chesapeake Bay Bald Eagle population and is recognized as having the largest summer concentration of non-breeding Bald Eagle east of the Mississippi River. Nearly 30 % of the breeding territories of the Virginia portion of the Chesapeake Bay Bald Eagle population are found in this area. Waterfront development is the most important limiting factor on the distribution and future population trends of Bald Eagle in this focus area. The forested wetlands of the James and Chickahominy Rivers support significant populations of Acadian Flycatcher, Yellow-throated Vireo, and Prothonotary Warbler. Although Acadian Flycatcher and Yellow-throated Vireo are found in upland habitats, they reach their highest density in riverine wetlands of this area. The Prothonotary Warbler is a secondary cavity nester so cavity availability limits habitat use. Prothonotary Warbler require a low, open canopy and moderate to high density of small stems and reach their highest densities in the flooded portions of these floodplains. Emergent wetlands are irregularly distributed along these tributaries and vary in suitability for different birds species based on salinity and associated physiognomic conditions. Marshes in tidal fresh and oligohaline zones (nearer to the fall line) are important breeding areas for King Rail whereas marshes in mesohaline zones and higher salt concentrations (nearer to the Chesapeake Bay) are more suitable for species such as Seaside

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Sparrow. Least Bittern are distributed across the entire range of salinity conditions and reach high densities within marshes of this focus area.

Threats:

Continued conversion of agricultural and forestland to urban uses is the greatest threat to this area. Changing habitats from high quality hardwood forests to loblolly pine plantations impact habitat quality. The lack of high quality riparian buffers impacts water quality. New introduction and spread of existing exotic invasives in this highly populated area can reduce available wildlife habitat.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior converted crop fields that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Restoration of streamside riparian buffers will improve water quality in the James River and the Chesapeake Bay. Exotic invasives, such as *Phragmites* are continuing to gain a foothold in the area, and treatment of these sites needs to be continued.

Focus Area: Rappahannock River, Virginia

Sub-Focus Areas: None

Area Description:

The Rappahannock River Focus Area is located in east-central Virginia covering portions of the Counties of Richmond, Lancaster, King George, Spotsylvania, Essex, and Middlesex. Encompassing 299,296 hectares (739,575 acres), the Lower Rappahannock Valley is within the Coastal Plain Province. Major physiographic units within the area include coastal plain uplands, low marine terraces, and fluvial river terraces. These terraces flank the River and are part of the Essex Escarpment. Historically the ocean floor, these lowlands follow the 15 meter (50 feet) contour line and are separated from adjacent uplands by the Essex Scarp. In some locations the Essex Scarp borders the river forming high bluffs and steep cliffs that attract large concentrations of federally threatened Bald Eagle. Much of the remaining land above the Essex Escarpment in the area is coastal plain uplands.

Most of the Rappahannock River Valley is dominated by forested uplands. These habitats are found on dry, well-drained sites and are vegetated by oak, yellow poplar, hickory, beech, and loblolly pine. A major habitat component of the area includes fresh, brackish, and saltwater tidal marshes, which provide some of the highest wildlife values in the estuarine ecosystem. The Rappahannock River's freshwater tidal marshes are usually eutrophic or hypereutrophic and occur at salinities from 0.0 parts per thousand to 0.5 parts per thousand. Plant diversity is high and includes federally threatened sensitive joint vetch, and other species such as wild rice, arrow arum, bur marigold, and smartweeds. Marshes located in the middle and downstream portion of the River are dominated by those vegetative species more adapted to higher salinities. Vegetative communities are primarily composed of big cordgrass, saltmarsh cordgrass, and brackish mixed communities. Interspersed throughout these marshes are tidal guts, creeks, ponds, and potholes. Salt marshes are major producers of detritus and they serve as a growth substrate for algae and other organisms. Marshes, with the dense mat of vegetation found in them, serve to control erosion by buffering wave energy and binding up the marsh substrate. Bottomland hardwood wetlands present on the river were formed from the deposition of alluvial material and downcutting of surface geology over time. These systems are dependent upon waterborne sediments to maintain substrate elevation relative to the river. Dominant tree species in these wetlands include river birch, sycamore, red maple, green ash, and black gum, with some bald cypress. Much of the land surrounding the Rappahannock River is in agricultural use. Major components of this land use type include cropland and to a much lesser degree, pastureland. Major crops include corn, soybeans, wheat, and barley. Most pastureland is used for grazing by beef cattle.

Ownership/Protection:

The U.S. Fish and Wildlife Service (USFWS) have an active acquisition effort to purchase property for the Eastern Virginia Rivers National Wildlife Refuge (NWR) Complex in this focus area. The USFWS is currently purchasing fee title and easements on a series of properties within their acquisition boundary. These tracts are not contiguous, but are acquired based on their value to wildlife. The Virginia Department of Game and Inland Fisheries own two properties, Lands End Wildlife Management Area, which is managed as a waterfowl refuge,

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and Pettigrew Wildlife Management Area. Fort A.P. Hill Military installation is also located in this focus area.

Special Recognition:

The Chesapeake Bay Estuarine Complex, Ramsar site was designated in 1987.

Waterfowl:

Six priority waterfowl species, (Black Duck, Mallard, Pintail, Greater and Lesser Scaup, Southern James Population Canada Goose) are found in this focus area. Mallard and Black Duck utilized this area for breeding, wintering and migration habitat. These species utilize flooded marshes and the adjacent rivers and lakes for food in the form of invertebrates, plant material and seeds. Northern Pintail utilize the area for wintering and migration habitat. Southern James Population Canada Goose use the river for loafing and feeding areas, and the adjacent open farm fields for foraging habitat. Scaup species utilize the open water on the river for migration and wintering habitat. Other priority species, including the Wood Duck, American Wigeon, Redhead, Canvasback, and Ring-necked Duck heavily utilize this area. The large expanses of open water provided by the Rappahannock provide optimum feeding for diving ducks, especially when submerged aquatic vegetation (SAV) is prevalent. Other waterfowl, including Tundra Swan, Atlantic Population Canada Goose, Blue and Green-winged Teal, Gadwall, and Northern Shoveler utilize this area extensively for wintering and migration habitat.

Table 1. Waterfowl species using the Rappahannock River Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck	X	X	X
Wood Duck	X	X	
Greater Scaup		X	X
Lesser Scaup		X	X
Ring-necked Duck		X	X
Redhead		X	X
Canvasback		X	X
Blue-winged Teal		X	
Green-winged Teal		X	X
Gadwall		X	X
Northern Shoveler		X	X
AP Canada Goose		X	X
SJBP Canada Goose		X	X
Tundra Swan		X	X
American Coot		X	X

DRAFT

Ruddy Duck		X	X
Bufflehead		X	X
Merganser		X	X

Other Migratory Birds:

This area supports nearly 30 % of the coastal population of Bald Eagle in Virginia. Waterfront development is the most important limiting factor on the distribution and future population trends of Bald Eagle in this focus area. The tidal fresh marshes of the upper reaches of the Rappahanock River are important for breeding King Rail, Virginia Rail, and Least Bittern. These marshes also appear extremely important for migrating Sora and wintering American Bittern. Marsh habitats of this area have become degraded as a result of *Phragmites* invasion although its effect on these bird populations is unknown. In addition, the small tributaries of the Rappahanock River provide small, sometimes isolated forested wetlands used by Acadian Flycatcher, Yellow-throated Vireo, and Prothonotary Warbler.

Threats:

Development of adjacent shoreline is a major threat to this region. Waterfront parcels with deep-water access have extremely high development value. The lack of adequate riparian buffers and access of livestock to creeks and streams allow the continued degradation of water quality, affecting the composition of SAV in the watershed. The spread of exotic invasives continues to be a problem. The conversion of hardwood forest habitat to planted loblolly pine plantations reduces water quality and cavities for cavity nesting species. Over-application of chemicals for agricultural row-crops continues to degrade water quality, exacerbated by the lack of adequate farmland buffers.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields and farmed wetland pasture that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Preservation of bottomland-hardwood forest for nesting Wood Duck needs to be addressed. The use of Department of Agriculture conservation programs will help install needed buffers.

Focus Area: Roanoke River, Virginia

Sub-Focus Areas: None

Area Description:

The Roanoke River Focus Area includes 656,490 hectare (1,622,215 acres) and is located in south-central Virginia covering portions of the Counties of Campbell, Charlotte, Halifax, Mecklenburg, and Pittsylvania. The area contains the Kerr Reservoir, which is a United States Army Corps of Engineers flood protection project. This area remains relatively undeveloped, and current development is slow. Two major river systems, The Roanoke and the Dan, feed into John H. Kerr Reservoir. These rivers are characterized by wide floodplains currently utilized for agricultural or forest product production. Historically, these floodplains were dominated by large expanses of bottomland hardwood forest.

Ownership/Protection:

The majority of land in this focal area is in private ownership. The United States Army Corps of Engineers owns several tracts of land adjacent to Kerr Reservoir. The Virginia Department of Game and Inland Fisheries have one wildlife management area (Dick Cross Wildlife Management Area) and The Virginia Department of Conservation and Recreation owns two State parks in the focus area.

Special Recognition:

None known.

Waterfowl:

Two high priority species, Mallard and Black Duck utilized this area for breeding, wintering and migration habitat. These species utilize flooded marshes and the adjacent rivers and lakes for food in the form of invertebrates, plant material and seeds. Other priority species, including the Wood Duck and Ring-necked Duck and Northern Pintail utilize this area. The large expanses of open water provided by Kerr Reservoir provide optimum feeding for diving ducks, especially when submerged aquatic vegetation (*Hydrilla*) is prevalent. Wood Duck thrive in the area where the old growth bottomland hardwoods remain, and also utilize open water and emergent marshes for brood rearing and staging. American Coot can be found in and around the marshes of Kerr Reservoir feeding on aquatic vegetation. This area is not surveyed during the Mid-winter waterfowl survey and only presence or absence of individual species is presented.

Table 1. Waterfowl using the Roanoke River Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck	X	X	X
Wood Duck	X	X	X
Greater Scaup		X	X
Lesser Scaup		X	X

DRAFT

Ring-necked Duck		X	X
American Coot		X	X

Other Migratory Birds:

This focus area is not significantly important to other high priority migratory species that are dependent upon wetland habitats when compared to coastal areas. Due to its geographic location and associated topography, there are very few forested or emergent wetlands available for such species. Wooded riparian habitats and small streams provide habitat for Louisiana Waterthrush. This species is generally more abundant in this area compared to coastal regions. Other species exist in scattered locations or represent disjunct populations. A colony of Yellow-crowned Night-Heron nests along the Roanoke River in the city of Roanoke that is separated from its regular distribution on the coastal plain by nearly 320 kilometers (200 miles). The Roanoke River and the Kerr Reservoir support small but increasing populations of Bald Eagle.

Threats:

Continued conversion of bottomland hardwood forest to loblolly pine plantations is a major threat in this region. The allowed access of livestock to streams and rivers in this watershed continues to degrade water quality in the region.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields and farmed wetland pasture that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Preservation of Bottomland hardwood forest for nesting Wood Duck needs to be addressed. United States Department of Agriculture programs such as Conservation Reserve Program and Conservation Reserve Enhancement Program will help install riparian buffers and fences on streams and rivers, enhancing water quality.

Planning Area: Shenandoah River, Virginia

Focus Areas: None

Area Description:

The Shenandoah River Planning Area is located in northwest Virginia covering 848,291 hectares (2,096,164 acres) of the Shenandoah River Valley. The Shenandoah Valley is extremely important to Virginia Waterfowl populations due to its impact on water quality concerns in the Chesapeake Bay. The Valley is an area of intense row crop agriculture and beef cattle pastureland, flowing directly into the Potomac River and the Chesapeake Bay. The area is also known for mass poultry production. Chicken and turkey houses abound in the vicinity, close to sources of cheap feed. Headwater wetlands are very important to water quality. The nutrients and chemicals, which flow into these sites, if not treated, can make their way over long distances, and have impacts far from the originating source. Habitat improvements conducted in this area can have large, beneficial impacts on Virginia's waterfowl populations.

Ownership/Protection:

Much of the non-agricultural land surrounding the Valley is in public ownership. The George Washington National Forest borders the Focus Area on the west and the Shenandoah National Park, including the Appalachian National Scenic Trail, borders the area on the East. The Virginia Department of Game and Inland Fisheries own, Goshen-Little North Mountain Wildlife Management area in the southern portion of the Focus Area. Of the agricultural lowlands, essentially all are in private ownership.

Special Recognition:

None known.

Waterfowl:

Three high priority species, Mallard, Pintail, and Black Duck utilize this area for wintering and migration habitat. These species utilize flooded marshes adjacent to the Shenandoah River and tributaries for food in the form of invertebrates, plant material and seeds. Wood Duck utilize this area for breeding habitat, using the wooded areas next to streams for nesting and brood rearing. This area is not surveyed during the mid-winter waterfowl survey. In addition to species listed in Table 1, conservation in this planning area would have benefits to many other waterfowl species using Chesapeake Bay.

Table 1. Waterfowl using the Shenandoah River Planning Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck		X	X
Wood Duck	X		
Northern Pintail		X	X

Other Migratory Birds:

This area is not significantly important to other high priority migratory species that are dependent upon wetland habitats when compared to coastal areas. This is mostly due to a lack of appropriate habitat. Louisiana Waterthrush are relatively more abundant in this planning area compared to coastal locations. This species is distributed within wooded riparian areas and along small streams. A few isolated forested wetlands provide habitat for Acadian Flycatcher, Prothonotary Warbler, and Northern Parula. Virginia Rail, Sora and Least Bittern are known to occur within a limited number of small freshwater marshes in the northern reaches of this planning area. Beaver ponds and sinkhole habitats may provide habitat for Golden-winged Warbler but the extent of use is unknown. Golden-winged Warbler requires shrubby, early successional habitats and are not entirely dependent of wetland habitats. The Shenandoah River harbors a relatively small, but increasing population of Bald Eagle.

Threats:

Agriculture plays a key role in the economics of this region. Continued fencerow-to-fencerow farming, lack of riparian buffers, and lack of fencing livestock from streams will continue impairing water quality. The practice of utilizing highly-concentrated fowl waste as fertilizer for agriculture increasingly allows nutrients in runoff. A large portion of this planning area is located in Northern Virginia, one of the fastest growing regions in the nation. Development of these sites will forever remove groundwater recharge areas and increase runoff into the river systems.

Conservation Recommendations:

Agricultural conservation groups are very active in the region. Continued utilization of programs such as Conservation Reserve Enhancement Program (CREP), The Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP) and others will help relieve pressure to intensively farm sites. Private non-profit groups such as Ducks Unlimited and The Chesapeake Bay Foundation and state groups such as the Virginia Department of Game and Inland Fisheries and the Virginia Department of Conservation and Recreation work with landowners in the region to develop environmentally-friendly land management plans to alleviate some of these problems.

Focus Area: Southeast Virginia, Virginia

Sub-Focus Areas: None

Area Description:

The Southeast Virginia Focus Area is located in portions of the Counties/Cities of Virginia Beach, Chesapeake, and Suffolk, excluding highly-developed areas. The area contains The Great Dismal Swamp, Back Bay, The North Landing River and Northwest River systems and encompasses 138,879 hectares (343,176 acres). This area is developing at a rapid pace, in spite of zoning protections put in place by the localities. Historically, the area was forested wetland habitat, primarily Atlantic white cedar, bald cypress and gum trees. There is a long history of draining these areas, beginning with George Washington, initially for agriculture and currently for urbanization. The farm fields found in this region are undoubtedly the most productive in Virginia, and are utilized for traditional agricultural crops as well as truck farm produce. The large open water wetlands of Back Bay were renowned in the 1960's for their abundance of submerged aquatic vegetation (SAV). Currently, the amounts of SAV are greatly reduced. The reduction is believed linked to water quality degradation linked to agricultural and residential runoff to Back Bay.

The four systems located within the focus area provide vital linkages for migrating birds following Virginia's river systems and the Atlantic Coast. The location of the project area, directly south of the Delmarva Peninsula, provides the first suitable habitat for migratory species funneled into the area across the Chesapeake Bay. The project location between two sites recognized for their global significance to birds, the Outer Banks of North Carolina and the Atlantic shoreline-barrier island system of the Delmarva Peninsula, further indicates its ecological value.

Ownership/Protection:

A patchwork of land is held for conservation purposes. The U.S. Fish and Wildlife Service has Great Dismal Swamp, Back Bay, and Mackay Island National Wildlife Refuges. The State of Virginia owns Princess Anne Wildlife Management Area, False Cape State Park, and several dedicated Natural Area Preserves. The City of Virginia Beach currently has an agricultural reserve program, which purchases development rights on property, and The Nature Conservancy has an active easement and land acquisition program on the North Landing River. Although these holdings seem impressive, a large majority of the land in this focus area is in private ownership. This land is highly sought for development in one of the fastest growing regions on the east coast.

Special Recognition:

This focus area occurs within the South Atlantic Migratory Bird Initiative (SAMBI) project area. The area includes Virginia, North Carolina, South Carolina, Georgia and Florida. In 1999, SAMBI was created from a coalition of federal, state and non-governmental partners to work toward long-term conservation of waterfowl, shorebirds, wading birds, songbirds and other vulnerable bird populations. Realizing that wildlife does not recognize political boundaries, SAMBI brings together a group of partners with similar issues to resolve wildlife issues at a larger scale. To date, SAMBI has worked with states in the partnership to further conservation issues important to all.

DRAFT*Waterfowl:*

Six priority waterfowl species (Black Duck, Mallard, Pintail, Greater and Lesser Scaup, Saint James Bay Population Canada Goose) benefit from habitats located within the focus area. Emergent marshes along Back Bay are heavily used by Black Duck and Mallard, and moderately used by Northern Pintail and other dabbling ducks during the fall, winter and migration periods. The marshes provide food in the form of plants and invertebrates, and serve as resting/roosting areas that are relatively free of disturbance. Restored, managed impoundments located on Back Bay National Wildlife Refuge, Virginia Department of Game and Inland Fisheries property and on private lands are heavily utilized by dabbling ducks and geese for foraging in this area during the staging and wintering periods. One to two thousand Greater and Lesser Scaup use the bay adjacent to these marshes and will benefit from protection and the water quality improvements that will result. The number of scaup and other diving ducks using Back Bay has declined in the past couple of decades because of the loss of submerged aquatic vegetation.

Species that will benefit during the breeding season include the Mallard, Wood Duck, and Black Duck. The Back Bay area is near the southern edge of the Black Duck breeding range, and small numbers still nest here. These habitats provide emergent plants/seeds, invertebrates, and SAV, which will benefit both dabbling and diving ducks. The forested wetlands will be moderately used by Black Duck, Mallard and to a lesser degree by Pintail during the fall, winter and migration periods. Scaup and Southern James Bay Canada Goose will use these areas only to a limited extent. Forested wetlands can serve as feeding areas for Black Duck and Mallard and can provide secure and undisturbed roosting areas.

Table 1. Waterfowl species using the Southeast Virginia Focus Area.

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
American Black Duck	X	X	X
Mallard	X	X	X
Northern Pintail		X	X
Gadwall		X	X
Greater Scaup		X	X
Lesser Scaup		X	X
American Wigeon		X	X
Canvasback		X	X
Redhead		X	X
Ring-necked Duck		X	X
Wood Duck	X	X	X
Tundra Swan		X	X
Greater Snow Goose		X	X
Blue-winged Teal		X	X
Green-winged Teal		X	X

DRAFT

SJBP Canada Goose		X	X
American Coot		X	X

Other Migratory Birds:

Due to its geographic position this focus area represents a transition zone between southern humid forested wetlands and northern archetypes and is also recognized as the distributional limit for a number of high priority bird species for conservation in the southeastern United States. Swainson's Warbler, Prothonotary Warbler, Worm-eating Warbler, and Wayne's Black-throated Green Warbler are largely restricted to forested wetlands or pocosin habitats. All of these species (except for the Prothonotary Warbler) are isolated from their Appalachian population centers. Wayne's Black-throated Green Warbler is found in the Dismal Swamp and associated with mature cypress and Atlantic white cedar. Populations of this species have declined drastically with the loss of historic Atlantic white cedar stands within this area. Swainson's Warbler and Worm-eating Warbler require dense under story vegetation such as switch cane or sweet pepperbush and are restricted to the Dismal Swamp and some surrounding areas.

The extensive barrier island/lagoon complex in this focal area forms a diverse array of beach habitats, intertidal mudflats, and marshlands that represent significant breeding, stopover, and wintering habitats for a number of bird species. Significant concentrations of migrating shorebirds can be regularly found at Back Bay National Wildlife Refuge and environs. Oligohaline marshes of this area support a significant population of King Rail and a number of high concern breeding species such as Marsh Wren, Seaside Sparrow, and Virginia Rail and regularly harbor high concern wintering species such as Nelson's Sharp-tailed Sparrow, Salt Marsh Sharp-tailed Sparrow, and Sedge Wren. Surprisingly, populations of colonial wading species (other than Great Blue Heron) and beach nesting species are extremely low in this focus area. Colonial beach nesting species are unable to colonize the primary dune habitats that constitute most of eastern shorelines of Back Bay NWR and False Cape State Park. Reasons for low numbers of other colonial-nesting species remain unclear.

Threats:

Continued conversion of agricultural and forestland to urban uses is the greatest threat to this area. The high-density livestock feeding operations located in this area can be detrimental to Back Bay water quality. New introduction and spread of existing exotic invasives in this highly populated area can reduce available wildlife habitat. The continued loss of water quality and the resulting loss of SAV impact numerous species on Back Bay.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior converted crop fields that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations. Exotic invasives, such as *Phragmites* are continuing to gain a foothold in the area, and treatment of these sites needs to be continued.

Focus Area: Western Bayshore, Virginia
Sub-Focus Areas: None

Area Description:

The Western Bayshore Marshes are abundant tidal brackish-water systems similar in character to the bayside marshes of the Eastern Shore. They include Mobjack Bay, the Guinea Marshes, The Piankatank River, Fleets Bay, Dividing Creek and the Great Wicomico River. The marshes open directly to the Chesapeake Bay and take their character from the Bay. The marshes consist mainly of *Spartina*, *Juncus*, and other salt tolerant species. Total waterfowl numbers are modest in this area; however, these are important habitats for many species. Development in this area is moderate, but increasing as the demand for waterfront property becomes more pronounced. Local watermen depend upon these marshes for a variety of species utilized for commercial gain. Adjacent lands are typically forested, intermixed with agricultural row-crops. The focus area encompasses 161,150 hectares (398,209 acres).

Ownership/Protection:

Public lands in this area are very limited. The Virginia Department of Conservation and Recreation owns a few small natural area preserves in the focus area, including Dameron Marsh Natural Area Preserve. The Virginia Institute of Marine Science owns a small tract of research land on the Dragon Run. The Virginia Department of Forestry also owns a small parcel on Dragon Run.

Special Recognition:

The Chesapeake Bay Estuarine Complex was a Ramsar designation in 1987.

Waterfowl:

Black Duck and Mallard utilize these marshes year-round, but especially heavy during the migration and winter periods. They feed upon the vegetation and invertebrates produced in quantity in these areas. Scaup spp. feed in the submerged aquatic vegetation (SAV) beds and invertebrates located in the Chesapeake Bay adjacent to these marshes. Atlantic Brant feed upon tidal mudflats adjacent to these marshes during the migration and wintering periods. Puddle ducks such as American Wigeon, Gadwall and teal utilize these areas for feeding and loafing during migration and wintering. Tundra Swan are found throughout the area during migration periods.

Table 1. Waterfowl using the Western Bayshores Focus Area

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck	X	X	X
Pintail		X	X
Tundra Swan		X	X
American Wigeon		X	X

Atlantic Coast Joint Venture - Focus Area Report
DRAFT

Gadwall		X	X
Blue-winged Teal		X	X
Green-winged Teal		X	X
Atlantic Brant		X	X
AP Canada Goose		X	X
Greater Scaup		X	X
Lesser Scaup		X	X
Ring-necked Duck		X	X
Canvasback		X	X

Other Migratory Birds:

A number of high priority bird species that utilize forested wetlands benefit from the expansive bottomland hardwood forests of the Piankatank River and Dragon Swamp. This swamp provides the most exemplary example of this habitat for Acadian Flycatcher, Prothonotary Warbler, and Northern Parula north of the James River. Tidal salt marshes within this area provide breeding habitat for Prairie Warbler, Virginia Rail, and Clapper Rail and for wintering Sedge Wren, Nelson's Sharp-tailed Sparrow, and Salt Marsh Sharp-tailed Sparrow. Black Rail occur in only a few marshes that meet their size and physiognomy requirements. Sandy beach habitat of the Bethel Beach Natural Area Preserve supports a small colony of Least Tern along with low numbers of American Oystercatcher. In addition to this site, American Oystercatcher use sandy portions and shell rakes of marsh islands in the surrounding area.

Threats:

As is common in coastal Virginia, urban and residential development remains a constant threat. Waterfront property is at a premium. Extreme demands exist for waterfront property with deepwater access provided by the creeks and rivers even in areas disjunct from large urban centers. Declining water quality in the Chesapeake Bay, stemming from over fertilization, sewage treatment, and the lack of adequate riparian buffers continues to affect quality waterfowl habitat.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields and farmed wetland pasture that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations.

Focus Area: York/Poquoson, Virginia
Sub-Focus Areas: None

Area Description:

The York/Poquoson Focus Area is located in east-central Virginia following the York River up to and containing the Mattaponi and Pamunkey River systems. The area encompasses 473,472 hectares (1,169,970 acres). These systems contain significant acres of tidal freshwater and brackish marsh, emergent, shrub-scrub, and forested wetlands. The York River has vast expanses of shallow, brackish, tidal areas heavily utilized by diving duck species. The adjacent uplands are primarily agricultural row-crops or loblolly pine plantations. The area has a rich cultural diversity, with both the Mattaponi and Pamunkey Indians Tribes utilizing the area. These areas are currently becoming developed to urban/residential at a very fast rate. The Mattaponi and Pamunkey River systems are key dabbling duck areas. Both river systems have abundant tidal gum swamps.

Ownership/Protection:

The majority of land in this focus area is in private ownership. The U.S. Fish and Wildlife Service owns Plum Tree Island National Wildlife Refuge (NWR). The Colonial National Historic Park is located adjacent to the lower York River. The U.S. Naval Weapons Station, Cheatham Annex and Camp Peary Naval Reservation are also all located on the lower York. The Virginia Department of Conservation and Recreation owns York River State Park, as well as several natural areas within the watershed. Both the Mattaponi and Pamunkey Indian Tribes have reservations within the focus area. The Virginia Department of Forestry owns two properties in the focus area.

Special Recognition:

The Chesapeake Bay Estuarine Complex was a Ramsar designation in 1987.

Waterfowl:

Six high priority species, Mallard, Black Duck, Northern Pintail, Southern James Bay Population (SJB) Canada Goose, Greater and Lesser Scaup utilize this area for wintering and migration habitat. These species feed on invertebrates, plant material and seeds in the marshes. Other priority species, including the Wood Duck, Ring-necked Duck, Redhead, Canvasback, and American Wigeon heavily utilize this area. Other waterfowl, Green and Blue-winged Teal, Gadwall, and American Coot also utilize these areas for wintering and migration habitat. Atlantic Population (AP) and SJB Canada Goose utilize the agricultural fields and adjacent marshes heavily during the wintering and migration periods.

Table 1. Waterfowl using the York River Focus Area

<u>Species</u>	<u>Breeding</u>	<u>Migration</u>	<u>Wintering</u>
Mallard	X	X	X
Black Duck	X	X	X
Wood Duck	X	X	

DRAFT

Northern Pintail		X	X
Greater Scaup		X	X
Lesser Scaup		X	X
Ring-necked Duck		X	X
Redhead		X	X
Canvasback		X	X
American Wigeon		X	X
Green-winged Teal		X	X
Blue-winged Teal		X	
Gadwall		X	X
Bufflehead		X	X
American Coot		X	X
AP Canada Goose		X	X

Other Migratory Birds:

The regular distribution of tidal-fresh marshes along the Pamunkey and Mattaponi Rivers (i.e., York River tributaries) support the most extensive breeding population of King Rail and Least Bittern in Virginia. These sites also appear to be important for migratory or wintering American Bittern, Sora, Short-eared Owl, and Sedge Wren. Polyhaline marshes within lower reaches of the York and Poquoson Rivers, the Chesapeake Bay, and the mouths of other tributaries support a number of high concern bird species that are exclusively dependent on tidal salt marshes (>18.0 ppt). Clapper Rail and Seaside Sparrow are highly abundant in low salt marsh zones of this area. Seaside Sparrow use nesting habitat that is above tidal flooding zones for incubation and brood rearing and require openings in the vegetation to forage on bare ground. Clapper Rail are dependent upon access to open water such as tidal creeks and ditches. Remaining priority species within salt marshes are those that use high marsh zones above regular spring tides. Black Rails are probably the most restrictive species and require marshes less than 10 hectares (24 acres) that contain a significant zone of high marsh composed of salt meadow hay and at least 50 % salt grass. The overall distribution of Black Rail is very limited in the state because of the low availability of marshes with the required physiognomy. Black Rail are only known to occur on the Plum Tree National Wildlife Refuge and a few other sites within this focus area. Prairie Warbler also use high marsh zones in this focus area during the breeding season, as do Henslow's Sparrow, Sedge Wren, Nelson's and Salt Marsh Sharp-tailed Sparrow during migration and winter. Forested swamps along these rivers provide habitat for Acadian Flycatcher, Prothonotary Warbler, and Northern Parula. The York River and tributaries are also important for breeding and non-breeding Bald Eagles. Nearly 12 % of the Bald Eagle nesting territories in the Virginia portion of the Chesapeake Bay is located in this focus area. A small population of American oystercatcher is distributed among beach habitats or shell rakes of the peninsular landform and marsh islands.

Threats:

The increase in residential development, though not yet at rates commensurate with other portions of the state, is the greatest threat to habitats in the focus area. Anecdotal information from landowners in the area suggests that some marshes have changed vegetative types over the past twenty years, possibly due to sea level rise in the area. Although the area does not have large amount of exotic invasives at present, concerns continue that these species may gain a foothold in the area.

Conservation Recommendations:

Continued acquisition and protection of land in a series of conservation corridors will help this area retain its usefulness for migratory birds. Prior-converted crop fields and farmed wetland pasture that are restored to wetland habitat provide excellent waterfowl habitat and receive high use in these areas. Continued restoration of these sites will help wintering and staging waterfowl populations.